

In the Specification

[0023] Referring to Fig. 2, a pair of ECG gated pulse sequences 110, 120 are shown on a common time axis t. Referring first to pulse sequence 110, which schematically shows a conventional ECG-gated black blood sequence, after an ECG trigger 112 of an R-R interval or heartbeat, a preparation sequence 114 is applied. Preparation sequence 114 includes a non-selective inversion pulse 114a followed by a slice-selective re-inversion pulse 114b that is slice-selective only for the imaged slice. After an inversion time TI, RF excitation pulses 116 are applied to acquire data for a single spatial location. Inversion time TI is selected to be of sufficient length to allow the magnetization of blood within the to-be-acquired slice reaches a null before data acquisition.

[0024] In the conventional ECG-gated black blood sequence 110 using double inversion pulses 114a, 114b schematically shown in Fig. 2, it should be noted that data is acquired from a single slice in the first R-R interval, and equilibrium magnetization is allowed to recover in the next heartbeat or R-R interval. As such, during this relaxation heartbeat, MR data is not acquired. Accordingly, with the conventional black blood sequence, data can only be acquired in every other heartbeat until all k-space data is acquired. As is customary, in order to minimize respiratory artifacts, images are typically acquired during an end-expiratory breath-hold. Further, in order to achieve sufficient coverage, typically eight to twelve contiguous slices are acquired in successive breath-holds. In this regard, with the conventional ECG-gated black blood sequence 110 illustrated, repeated breath-holds are required to acquire a set of slices, one slice being acquired per breath-hold.